

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

TITLE V ADMINISTRATIVE AMENDMENT DRAFT PERMIT NO. V-05-068 R1

FREE-FLOW PACKAGING INTERNATIONAL, INC.

HOPKINSVILLE, KY

November 8, 2007

PHILIP T. JARBOE, P.E., REVIEWER

SOURCE I.D. #: 21-047-00099

SOURCE A.I. #: 37673

ACTIVITY #: APE20070002

**ADMINISTRATIVE PERMIT REVISION 1:**

This revision changed the capacity values shown in the *Emission Unit Description* that were incorrect based on the renewal application. The emission factors were also changed to use the product produced as a basis instead of the blowing agent used.

**SOURCE DESCRIPTION:**

Free Flow Packaging International (FP International), Incorporated produces foamed polyethylene and polystyrene sheets for packaging. In the polyethylene foam plant, polyethylene along with isobutane, ethane, and glycerol monostearate are used as the raw materials and are injected into the extruder. The extruded foamed polyethylene sheets go through the slit tube and winder. The wound foamed polyethylene sheets are stored in the warehouse. The bad sheets (approximately 8%) are reprocessed to get polyethylene resin. The major emissions from this process are the VOC's (Isobutane emissions). The source also has isobutane and ethane storage tanks. The isobutane tanks are pressurized tanks. The ethane tanks are tube trailers and are not filled on site. They are replaced as needed.

In the polystyrene loosefill plant, polystyrene is fed to an extruder where it is melted and pressurized and injected with a blowing agent mixture of isopentane and isobutane. As the material exits the extruder it creates a plastic foam which is then formed into a trademark "Figure 8" cross-section, cooled, and cut into finite pieces. The cut particles from the extrusion line are then passed through an expander where they are exposed to live steam. The particles are then held for several hours in the intermediate storage silos while additional expansion occurs. The particles are then put through a second expansion step in which they are again exposed to live steam. The expanded product is dried in the hot room, which is heated to approximately 140°F. The product from the hot room is transferred to the warehouse where it is stored until it is packaged in fourteen cubic foot bags or loaded directly into bulk trailers for shipment.

The source consists of the following permitted emission units:

(a) Polyethylene Foam Plant, consisting of:

- (1) One (1) foam extrusion line, consisting of polyethylene foam sheet extruder, slit tube and winder, identified as P-1 and constructed in June 1999, with a maximum foam sheet processing rate of 4,787 tons per year, and exhausting to one (1) stack P1;
- (2) One (1) Polyethylene scrap reprocessing operation, identified as P-2 and constructed in June 1999, with a maximum foam sheet processing rate of 361 tons per year, and exhausting to one (1) stack P2;
- (3) One (1) Polyethylene foam sheet warehouse, identified as W-1 and constructed in June 1999, with a maximum foam sheet processing rate of 4,377 tons per year, and exhausting inside the building.

(b) Polystyrene Loosefill Plant, consisting of:

- (1) One (1) Polystyrene extrusion line, consisting of polystyrene loosefill extruder, identified as P-3 and constructed in 2001, with a maximum foam processing rate of 2,033 tons per year, and exhausting to one (1) stack P3;
  - (2) One (1) Polystyrene expansion equipment, identified as P-4 and constructed in 2001, with a maximum foam processing rate of 1,968 tons per year, and exhausting to one (1) stack P4;
  - (3) Polystyrene intermediate storage and hot room, identified as W-2 and constructed in 2001, with a maximum foam processing rate of 1,949 tons per year, and exhausting inside the warehouse;
  - (4) Polystyrene product storage, identified as W-3 and constructed in 2001, with a maximum processing rate of 1,924 tons per year, and exhausting inside the warehouse;
- (c) One (1) insignificant natural gas fired boiler, identified as B-1, constructed in 2005, with a maximum heat input rate of 5.23 million British thermal units per hour, exhausting through one (1) stack B1; and
- (d) One (1) crystal clean cold cleaning degreaser, identified as EP-1, with a maximum solvent consumption rate of 24 gallons per year.

The source did not install the permitted Polystyrene reclaim operation, identified as R-1. Therefore, the reclaim operation is not included in the permit.

The potential to emit (as defined in 401 KAR 52:001, Section 1 (56)) of VOC is greater than one hundred (100) tons per year. Therefore, the source is a major source and is subject to the provisions of 401 KAR 52:020.

This permit is the renewed issuance of the source's Title V operating permit.

**COMMENTS:**

**Type of control and efficiency:**

None

**Emission factors and their source:**

AP-42, Chapter 1.4, Tables 1.4-1, 2 and 3 were used to determine the natural gas combustion emissions from the steam boiler. As required in initial Title V Permit No. V-99-012, and subsequent Revision 2, process emissions from the polyethylene and polystyrene processes were determined based on stack tests performed on March 21, 2001 and February 5, 2002. The resultant tested emission factors were consistent with the pre-test factors initially specified in Permit No. V-99-012 and Revision 2. As such, KDAQ decided to continue to accept the pre-test factors, and these factors are reflected in the emission calculations and conditions of this permit renewal. The only exception to this relates to PS Product Storage (W-3), which tested at zero VOC emissions. Since there are no emissions attributable to this storage facility, the Compliance Demonstration Method formula of the existing permit are revised to eliminate reference to this storage facility. The VOC emissions from the degreaser are based on the MSDS sheets and material balance for the cleaning solvent.

**Existing Approvals:**

1. *Title V Permit No. V-99-012, issued on May 5, 1999*

This permit was the first air quality approval for this source. The permit specified terms and conditions for the operation of the polyethylene foam extrusion line, foam reprocessing equipment and foam warehouse.

2. *Title V Permit No. V-99-012 (Revision 1), issued on April 28, 2000*

This permit was the first revision to the Title V permit. With this approval, the permittee replaced two (2) 12,000 gallon isobutane tanks with two (2) 14,000 gallon isobutane tanks, installed six (6) blown film lines and product sheeting, splitting, perforating and laminating equipment.

3. *Title V Permit No. V-99-012 (Revision 2), issued on May 24, 2001*

This permit was the second revision to the Title V permit, and it approved the installation of equipment used to produce PS loosefill foam. The permit specified terms and conditions for the operation of the polystyrene extrusion line, polystyrene expansion line, polystyrene

intermediate storage and hotroom, polystyrene product storage and polystyrene reclaim equipment.

4. *Title V Permit No. V-05-682 (Renewal), issued on May 15, 2005*

This permit was the renewal for Title V Permit No. V-99-012.

5. *Title V Permit No. V-05-682 (Revision 1), issued on October 25, 2007.*

This revision changed the capacity values shown in the *Emission Unit Description* that were incorrect based on the renewal application. The emission factors were also changed to use the product produced as a basis instead of the blowing agent used.

**Applicable Regulations:**

- (a) *401 KAR 59:010, New Process Operations*

There are no particulate emissions from any process operation at the facility. Therefore, the requirements of 401 KAR 59:010 do not apply to this facility.

- (b) *401 KAR 59:015, New Indirect Heat Exchangers*

Pursuant to 401 KAR 59:015, Section 1, the requirements of this rule apply to each indirect heat exchanger having a heat input capacity of more than one (1) million BTU per hour and that commenced on or after the applicable classification date defined in Section 2 (3) of the rule. Since the natural gas fired boiler, identified as B-1, has a maximum heat input capacity of 5.23 mmBTU/hr which is greater than the rule applicability threshold, 401 KAR 59:015 is an applicable rule.

- (c) *401 KAR 50:012, General Application*

Pursuant to 401 KAR 50:012, Section 1(1), all major sources of VOCs located in a county or portion of a county which is designated ozone nonattainment, for any nonattainment classification except marginal, under 401 KAR 51:010, shall install and use control technology which is reasonable and available. The source is a major source of VOCs and no other VOC control requirements currently apply. Section 1(2) of 401 KAR 50:012 mandates at major air contaminant sources the use of control procedures if they are found to be reasonable, available, and practical. The source submitted reasonable, available and practical control technology plans to the Division on December 4, 2000. The review indicated that the control technology (Regenerative Thermal Oxidizer) most suited for this affected facility is not reasonable and practical. Therefore, there are no VOC control requirements currently included in the permit.

**Non-Applicable Regulations:**

- (a) The requirements of 40 CFR 60, Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, are not included in the permit for the steam boiler because the maximum heat input capacity of the boiler is less than the rule applicability threshold of 10 MMBtu/hr.
  - (b) The requirements of 40 CFR 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels*, are not included in the permit for two (2) 14,000 gallon isobutane tanks because the storage vessels are pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.
  - (c) The requirements of 40 CFR 64, *Compliance Assurance Monitoring*, are not included in the permit for any emission unit at this source because all emission units at this source have an uncontrolled PTE at less than 100 percent of the applicable major Part 70 threshold for VOC and HAPs. Therefore, pursuant to 40 CFR 64.2 (a), the requirements of this rule are not included in the permit.
  - (d) Pursuant to 401 KAR 59:185, Section 8, the requirements of 401 KAR 59:185, *New Solvent Metal Cleaning Equipment*, are not included in the permit for the cold cleaner degreaser because:
    - (1) The degreaser has a 16 gallon remote solvent reservoir;
    - (2) The solvent (Crystal Clean 106 Mineral Spirits) has a vapor pressure less than 5.17 mm Hg at 100°F;
    - (3) The degreaser has an open drain area of 56 sq. cm;
    - (4) There is a lid cover over the sink that is closed when not in use. Further, the solvent is stored in the remote reservoir. Crystal-Clean periodically also removes the waste solvent and disposes it off.
- Since the cold cleaning degreaser meets all of the above criteria, this rule has been determined to not apply and the requirements of this rule are not included in the permit.
- (e) Pursuant to 40 CFR 63.460 (a), the requirements of 40 CFR 63, Subpart T, *National Emission Standards for Hazardous Air Pollutants (NESHAP) for Halogenated Solvent Cleaning*, do not apply to the cold cleaning degreaser because the source does not use any solvent containing methylene chloride (CAS No. 75-09-2), perchloroethylene (CAS No. 127-18-4), trichloroethylene (CAS No. 79-01-6), 1,1,1-trichloroethane (CAS No. 71-55-6), carbon tetrachloride (CAS No. 56-23-5) or chloroform (CAS No. 67-66-3), or any combination of these halogenated HAP solvents, in a total concentration greater than 5 percent by weight, as a cleaning and/or drying agent.
  - (f) There are no NESHAPs (40 CFR 63 and 401 KAR 63) applicable to this existing area source for HAP emissions, as such is defined at 40 CFR 63.2.

**Source Status**

- (a) This existing source is a major stationary source for PSD review because this type of operation is not one of the twenty-eight (28) listed source categories under 401 KAR 51:017 and the sourcewide VOC emissions are greater than 250 tons per year or more.
- (b) Christian County is designated as non-attainment for the 8-hour ozone standard and VOC is emitted at a rate greater than 100 tons per year. Therefore, this existing source is a major stationary source under Emission Offset, 401 KAR 51:052.

**Emission and Operating Caps Description:**

The source requested to limit VOC emissions from the PE foam plant and PS loosefill plant to less than 245 tons per year and 225 tons per year, respectively. The source is not restricted as to hours of operation or quantity of product produced while remaining within these emissions limitations.

**Credible Evidence:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.